

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

**Claim 1 (original):** A media streaming delivery system, comprising:

a media delivery apparatus for transmitting a media stream in packets to a network according to a real time transfer protocol;

a relay apparatus connected to said network for transmitting said media stream to a communication link with a large delay; and

packet analysis means for monitoring said packet arriving at said relay apparatus and transmitting feedback information indicating a status of said network to said media delivery apparatus.

**Claim 2 (currently amended):** The delivery system according to claim 1, wherein said feedback information is ~~[[a]]~~ an acknowledge response sent to said relay apparatus each time a packet of said media stream arrives.

**Claim 3 (original):** The delivery system according to claim 1, wherein said feedback information is a sequence number of a packet lost from said media stream.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 4 (currently amended):** The delivery system according to claim 2 [[or 3]], wherein said media delivery apparatus is arranged to modify said media stream based on said feedback information.

**Claim 5 (original):** The delivery system according to claim 4, wherein said communication link with a large delay is a wireless link.

**Claim 6 (original):** The system according to claim 4,  
wherein said media stream is a video including a sequence of I-pictures and P-pictures; and

wherein said media delivery apparatus comprises:

a storage for storing a plurality of media streams for one video, including at least a first media stream containing I-pictures in a first arrangement and a second media stream containing I-pictures in a second arrangement which is different from said first arrangement; and

switching means for, in response to determination of said packet loss, for the destination for which said loss has occurred, selecting a media stream in which a first I-picture after the picture in said lost packet appears earliest among said plurality of media streams, and switching the media stream to be sent to said selected media stream.

**Claim 7 (original):** The system according to claim 6,

Docket No.: 200206828-03 (Our ref.: 1509-514)

**PATENT**

wherein said media stream is a video including a sequence of I-pictures and P-pictures;

wherein said media delivery apparatus comprises an encoding device for generating said media stream; and

wherein said encoding device is arranged to generate a media stream starting with an I-picture in response to determination of said packet loss.

**Claim 8 (original):** A packet analysis apparatus, comprising:

detecting means connected to a network for receiving a packet transmitted in said network and detecting a media stream; and

packet analysis means for detecting loss of a packet in said detected media stream and performing feedback to a source of said media stream.

**Claim 9 (original):** A network relay apparatus comprising the packet analysis apparatus according to claim 8,

wherein said network relay apparatus sends to said source identification information of a packet received from said network and sent to a communication link different from said network.

**Claim 10 (original):** The relay apparatus according to claim 9, wherein detection of said packet loss is performed based on sequence numbers included in headers of a sequence of packets constituting said media stream.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 11 (original):** A media delivery apparatus used for delivering a media stream comprising a sequence of packets,

wherein said apparatus is arranged for, in response to feedback relating to packet loss on a delivery path of said media stream, modifying said media stream so as to reduce an influence of said loss.

**Claim 12 (original):** The media delivery apparatus according to claim 11,

wherein said media stream is a video including a sequence of I-pictures and P-pictures;

wherein said media delivery apparatus comprises an encoding device for generating said media stream; and

wherein said encoding device is arranged to generate a media stream starting with an I-picture in response to determination of said packet loss.

**Claim 13 (original):** The media delivery apparatus according to claim 12, wherein said feedback relating to said packet loss is feedback relating to said packet loss observed at a point where said delivery path switches from a link with a small delay to a link with a large delay.

**Claim 14 (original):** The media delivery apparatus according to claim 13, wherein said link with a small delay is a wired link and said link with a large delay is a wireless link.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 15 (original):** The media delivery apparatus according to claim 11 wherein said media stream is a video including a sequence of I-pictures and P-pictures, said media delivery apparatus comprising:

a storage for storing a plurality of media streams for one video, said plurality of media streams including at least a first media stream including I-pictures in a first arrangement, and a second media stream including I-pictures in a second arrangement which is different from said first arrangement; and

switching means for, in response to determination of said packet loss, for a destination in which said loss has occurred, selecting a media stream in which a first I-picture appears earliest after said lost packet among said plurality of media streams and switching the media stream to be sent to said selected media stream.

**Claim 16 (original):** The media delivery apparatus according to claim 15, wherein said encoding device is arranged such that, in response to detection of a packet loss based on feedback information from said packet analysis apparatus, said encoding device increases a frequency of I-pictures at least for a media stream transmitted to a destination for which said loss has occurred.

**Claim 17 (original):** The media delivery apparatus according to claim 15, wherein said encoding device is arranged such that, in response to detection of said packet loss based on feedback information from said packet analysis apparatus, said encoding device transmits a media stream starting with an I-picture to the destination for which said loss has occurred.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 18 (original):** The media delivery apparatus according to claim 14, wherein said media delivery apparatus performs said retransmission of a packet based on said feedback information relating to a packet loss.

**Claim 19 (original):** A relay apparatus for connecting a communication link with a small delay and a communication link with a large delay, comprising:

a first feedback device for receiving a packet of a media stream transmitted on said link with a small delay, and transmitting information including a packet loss rate over a predetermined period to a transmission source;

adjusting means for adjusting passage of packets received from said network according to transmission capability of said communication link with a large delay; and

a second feedback device for transmitting to said transmission source a acknowledge response about a packet transmitted through said adjusting means to said communication link.

**Claim 20 (original):** The relay apparatus according to claim 19, wherein said second feedback device transmits to said transmission source a sequence number included in a header of said packet transmitted through said adjusting means to said communication link with a large delay.

**Claim 21 (original):** A media stream delivery system, comprising:

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

a media delivery apparatus for transmitting a media stream in packets to a network by using a real time transfer protocol; and

a relay apparatus connected to said network for transmitting said media stream to a communication link with a large delay, said relay apparatus comprising:

a first feedback device for receiving a packet of said media stream transmitted in said network and transmitting information including a packet loss rate over a predetermined period to a transmission source; adjusting means for adjusting passage of packets received from said network according to a transmission capability of said communication link with a large delay; and a second feedback device for transmitting to said transmission source a acknowledge response about a packet transmitted through said adjusting means to said communication link.

**Claim 22 (original):** The media stream delivery system according to claim 21, wherein said communication link with a large delay is a wireless link, and wherein said system is arranged such that, if a receiving buffer of a wireless terminal is large, retransmission is performed based on a acknowledge response from said wireless terminal.

**Claim 23 (original):** The delivery system according to claim 21, wherein said communication link with a large delay is a wireless link, and wherein said system is arranged such that, if a receiving buffer of a wireless terminal is not large enough to accommodate retransmission from said media delivery apparatus, said relay apparatus transmits said media stream with an error correction code added.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 24 (original):** The delivery system according to claim 21, wherein said communication link with a large delay is a wireless link, and wherein said system is arranged such that, if a receiving buffer of a wireless terminal is small, said media delivery apparatus adds an error correction code to a media stream transmission on said communication link with a small delay.

**Claim 25 (new):** A media stream delivery method, comprising:  
transmitting a media stream in packets to a network by using a real time transfer protocol; and

transmitting said media stream from the network to a communication link with a large delay by:

receiving a packet of said media stream transmitted in said network and transmitting information including a packet loss rate over a predetermined period to a transmission source;

adjusting passage of packets received from said network according to a transmission capability of said communication link with a large delay; and

transmitting to said transmission source an acknowledge response about a packet transmitted with said adjustment to said communication link.

**Claim 26 (new):** The media stream delivery method according to claim 25, wherein said communication link with a large delay includes a wireless link with wireless terminal including a receiving buffer, further including performing a retransmission if a



Docket No.: 200206828-03 (Our ref.: 1509-514)

**PATENT**

receiving buffer of a wireless terminal is large based on an acknowledge response from said wireless terminal.

**Claim 27 (new):** A media streaming delivery method, comprising:  
transmitting a media stream in packets from a first device to a network according to a real time transfer protocol;  
relaying said media stream from the network to a communication link with a large delay by using a second device; and  
monitoring said packets as they arrive at said second device and transmitting feedback information indicating the status of said network to said first device.

**Claim 28 (new):** The delivery method according to claim 27, wherein said feedback information is an acknowledge response sent to said second device each time a packet of said media stream arrives at the second device.

**Claim 29 (new):** The delivery method according to claim 27, wherein said feedback information is a sequence number of a packet lost from said media stream.

**Claim 30 (new):** The delivery method according to claim 28, further including modifying said media stream transmitted from the first device based on said feedback information.

Docket No.: 200206828-03 (Our ref.: 1509-514)

PATENT

**Claim 31 (new):** The delivery method according to claim 30, wherein said communication link with a large delay is a wireless link.

**Claim 32 (new):** The method according to claim 30, wherein said media stream includes a video having a sequence of I-pictures and P-pictures; and

said first device performs the following steps:

storing a plurality of media streams for one video, including at least a first media stream including I-pictures in a first arrangement and a second media stream including I-pictures in a second arrangement which is different from said first arrangement; and

responding to said packet being lost by (a) selecting a media stream in which a first I-picture after the picture in said lost packet appears earliest among said plurality of media streams, and (b) switching the media stream to be sent to said selected media stream, the selecting and switching steps being performed for the destination for which said loss has occurred.

**Claim 33 (new):** The method according to claim 32, wherein said media stream includes a video having a sequence of I-pictures and P-pictures; and further including generating a media stream starting with an I-picture in response to said packet being lost.

Docket No.: 200206828-03 (Our ref.: 1509-514)

**PATENT**

retransmission is performed based on a acknowledge response from said wireless terminal.

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